CONTROLLING THE SPREAD OF RABIES IN WILDLIFE AND TRANSMISSION TO HUMANS

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ISSUES

The mission of the Wildlife Bureau of the Michigan Department of Natural Resources (DNR) is: *to enhance, restore, and conserve the State's wildlife resources, natural communities, and ecosystems for the benefit of Michigan's citizens, visitors, and future generations.* Implicit in this mission statement is the goal of maintaining viable populations of wildlife species for Michigan's citizens and visitors. An important function of the DNR is to make recommendations to the Natural Resources Commission (NRC) concerning methods and manner of take of species under NRC authority. All recommendations are established with consideration of the biological and social impacts of proposed changes and are based on the best available scientific information.

Rabies is an important viral disease in Michigan because of its human health significance. Rabies is a disease that is diagnosed every year in Michigan's wildlife and domestic species. Any mammal, including humans, can contract rabies, with the most common Michigan wildlife species affected being bats, skunks, and fox. The primary domestic species affected are cats, cows, and horses. There are many strains of rabies in North America with each strain adapted to transmission in a particular mammalian host. There are two strains of the rabies virus in the State, the bat-strain and the skunk-strain. Humans and pets are most commonly exposed to bats and the bat-strain of rabies in Michigan. Another strain of rabies, known as raccoon rabies, not currently in Michigan, is an epidemic in the eastern United States and is currently moving through eastern Ohio at a rate of about 25 miles per year. In some eastern states, the spread of this disease was significantly accelerated by human-assisted transportation of raccoons within and between states.

Due to the threat of rabies to human health and the spread of raccoon-strain rabies in the United States, a multi-agency rabies working group was organized in 1997. The group includes representatives from the Michigan Department of Natural Resources, Michigan Department of Agriculture, Michigan Department of Community Health, Michigan State University, United

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States Department of Agriculture (Animal and Plant Health Inspection Service), physicians from county Health Departments, Michigan United Conservation Clubs, Michigan Association of Animal Control Officers, Michigan Farm Bureau, Michigan Veterinary Medicine Association, Michigan Humane Society, and the University of Michigan. This group was formed to: (1) educate the citizens of Michigan concerning rabies and the various strains of rabies; (2) prevent new strains of rabies from becoming established in Michigan; (3) prevent an increase in the disease and risk to humans, pets, and livestock from existing strains of rabies; (4) implement rabies research; and (5) promote recommendations necessary to protect the health, welfare, and economic interests of the people of Michigan.

Nationwide, rabies commonly occurs in bats, skunks, fox, coyotes, raccoons, and a wide variety of other wildlife species. In Michigan, rabies occurs most commonly in bats (averaging 20-30 a year). In most years, a small number of skunks (1-2) are also diagnosed with the disease. Historically, skunks were the main wildlife species affected, but this trend changed in the late 1970s when bats became the primary species. This trend continues today. Most cases of rabies occur in bats in the southern portion of the Lower Peninsula, but this may be more of a reflection of the human population distribution in the State and the resultant increased likelihood of having contact with a rabid animal. The majority of human rabies deaths in the last 20 years in the United States have been caused by the rabies virus from bats. Michigan's last fatal case of human rabies was due to the bat-strain rabies as well.

Bats and raccoons are in need of regulatory changes for different reasons. Bats, being the primary wildlife species in Michigan in which the rabies virus occurs, need to have controls over their taking and possession, similar to skunks, because of their human health significance. Regulatory changes for raccoons are needed as a preventative measure to minimize the spread of raccoon-strain rabies, should it enter Michigan.

BACKGROUND AND DISCUSSION

BAT RABIES

BIOLOGICAL IMPACTS

Nine species of bats are known to occur in Michigan. The two most common species are the big brown bat and little brown bat. These two species are also the most likely to contact humans because they readily use human structures for nursery and wintering areas. Michigan also has two rare species, the eastern pipestrelle (listed as special concern) and the Indiana bat (federally endangered). Because of the areas the bats inhabit, neither is likely to be associated with rabies transmission to humans. While little data is available on abundance of other species of bats, there is no indication that any are in decline or are of concern to the issues addressed in this paper.

Though there are not good quantitative estimates of bat populations, the number of bats that are at issue for transmission of rabies is insignificantly small. This proposed rule will have no

biological impact on bat populations and may result in an increased awareness of bats and how to deal with human-bat interactions.

SOCIAL CONCERNS

Currently, many people believe that bats, like birds, are fully protected. In recent years, more and more information regarding bats has been made available. Much of this information focuses on the beneficial aspects of bats. However, as more people become aware that bats are not protected, taking from the wild may become more common, thus increasing the risk of rabies transmission to humans.

Also, using live bats in educational programs is becoming more popular. Current State regulations require that individuals using animals in educational programs qualify for and possess a permit authorizing such activity. Whether or not "animals" in this context includes "non-protected animals" is subject to interpretation. Defining bats as protected animals would further reinforce that their use in educational programs is only allowed by qualified individuals under permit.

Another social concern regarding bats and their current non-protected status relates to the potential for malicious and indiscriminate killing of large colonies of bats. Currently, such an action would not be prosecutable under the Natural Resources and Environmental Protection Act.

LAW ENFORCEMENT CONCERNS

Under State law, the taking, release, transport, selling, buying, and possession of game and protected animals is regulated by law, orders of the NRC, and interim orders of the Director of the Department of Natural Resources. Because of the potential disease risks associated with bat-human contact, wildlife rehabilitator permits have prohibited the possession of bats. However, because bats are not classified either as game or as a protected animal, the prohibition is not currently enforceable. The NRC has the authority to determine protected animals, and this order proposes to classify bats as protected animals. This classification would make the current prohibition on rehabilitation an enforceable regulation.

RACCOON RABIES

CURRENT STATUS OF RACCOON RABIES IN THE UNITED STATES

Raccoon-strain rabies was first diagnosed in the early 1950s in Georgia and Florida. It was not detected anywhere else except in those two states. In 1978, an outbreak of raccoon-strain rabies began in northern Virginia, probably due to translocation of raccoons by hunters from the Georgia/Florida area. From 1978 on, raccoon-strain rabies spread along the eastern seaboard, eventually occurring from Florida to Maine. The disease then began spreading in a westerly direction across New York, Pennsylvania, and West Virginia. In 1997, the disease reached the northeastern corner of Ohio. Data for rabies cases in the United States in 1997 showed that 50 percent of all animal rabies was associated with raccoons. The affected states have undertaken numerous control programs with the most common program involving oral vaccination of the

raccoons. This is an expensive program (millions of dollars in some cases), but it is highly regarded by the general populace because it is a pro-active program. Agencies involved with an outbreak have also utilized extensive educational programs for citizens of their states and encouraged pet and livestock vaccination programs.

BIOLOGICAL IMPACTS

Raccoons occur in all counties in Michigan. They are most abundant in the Lower Peninsula, particularly in the southern half. Population densities generally decline from the southern one-third of the State to the Upper Peninsula due to habitat quality, food abundance and availability, and winter severity. Densities reported in the literature range from one raccoon per acre to one per 150 acres. High densities are found along river bottoms or agricultural areas that are well interspersed with woodlands and waterways, and range from one animal per 10 acres to one per 16 acres. Lower population densities are typical of evergreen forests. In residential areas where food may be abundant and cover is plentiful, raccoons may approach even greater densities. Hoffmann and Gottschang (1977) found an exceedingly high raccoon population in a suburban community near Cincinnati, Ohio, where the density in the study area was approximately one animal per 3.7 acres. There are an estimated 2-3 million raccoons in Michigan at the time that hunting and trapping seasons begin each year.

Statewide management goals are directed toward maintaining current levels of raccoon harvests. Hunters and trappers have harvested 200,000-300,000 animals annually during the past decade. Raccoon hunting with hounds is very popular in Michigan. Raccoon hunters take approximately two-thirds of the raccoons harvested in Michigan each year. Trappers also harvest thousands of raccoons annually by using a variety of traps and trapping techniques. Many raccoons are killed by vehicles while crossing highways, particularly in the spring when young disperse, and males search for mates.

Raccoons are capable of transmitting rabies, canine distemper, and parvovirus to domestic dogs and rabies and roundworms (*Baylisascaris)* to humans. Disease is most prevalent in populations that become too great to be supported by available food and habitat. Many raccoon populations are at or approaching carrying capacity, particularly in the southern-most third of the State. Raccoons have few natural predators. Population control has been in the hands of hunters and trappers. Low fur prices, trespass concerns, and hunting/trapping closures have contributed to a decline in license sales in recent years. The subsequent increase in raccoon populations is evident by the number of road-killed animals, nuisance complaints, and cases of diseased animals. Currently, there are no state regulations limiting the distance which licensed wildlife rehabilitators and wildlife damage and nuisance control permittees may transport and release captured raccoons. If and when raccoon rabies comes to Michigan, the movement of apparently healthy raccoons that are incubating the rabies virus may spread the disease around the State so quickly and so completely that control attempts would be impossible. Also, raccoon rabies may already exist undetected in Michigan, and movement of raccoons may spread the disease around the State before the first case is diagnosed.

SOCIAL CONCERNS

There are approximately 275 licensed wildlife rehabilitators in Michigan, and many more volunteers are working under those licensees. Licensed wildlife rehabilitators are prohibited from possessing skunks or bats because of the risk of rabies transmission. Some rehabilitators and members of the general public disagree with this regulation and feel that at least certain groups should be allowed to possess these animals. Currently, it is legal to rehabilitate injured or orphaned raccoons in Michigan. The licensed wildlife rehabilitation community in Michigan is divided on the issue of whether or not raccoons should be rehabilitated. Some do not rehabilitate raccoons because they are not a species of interest to them. Others have chosen to not rehabilitate, relocate, or release raccoons because of potential disease transmission; a poor chance of survival; and competition for food and nesting sites with already overpopulated resident raccoons. They feel that the humane solution is euthanasia of these animals.

Other licensed wildlife rehabilitators feel that they should be allowed to rehabilitate injured and orphaned raccoons. Rehabilitators in this group probably put as much or even more importance on the welfare of an individual animal than on the population of a species of animals.

The charismatic nature of young raccoons leads many people to want to assist these orphaned or injured animals. Because of this perception, a potential negative impact of restricting raccoon rehabilitation is that once the legal option of taking raccoons to a rehabilitator is removed, the public will decide to keep the raccoons themselves. This activity could become widespread, leading to increased chances of disease exposure. Some eastern states did outlaw the rehabilitation of raccoons and later reversed that decision because of this problem.

There are approximately 400 licensed wildlife damage and nuisance control businesses in the State of Michigan. Social issues concerning raccoons are not as great for this group as for rehabilitators. Many wildlife nuisance control permittees agree that humane euthanasia is biologically the most appropriate option for live-trapped raccoons. However, their clientele often insist on relocation over euthanasia. In the early 1990s, the State of Michigan prohibited the relocation of animals live trapped in the greater Detroit area by licensed nuisance wildlife control operators be euthanized. That decision was soon reversed due to the negative public outcry.

LAW ENFORCEMENT CONCERNS

Currently, there are no State regulations limiting the distance which licensed wildlife rehabilitators and wildlife damage and nuisance control permittees may transport and release captured raccoons. Proposed Amendment No. 10 of 1999, under authority of Sections 40107 and 40113a, Act No. 451 of the Public Acts of 1994, as amended, provides three options for restricting the holding, release, and translocation of raccoons in Michigan.

- Option 1 would simply prohibit the release of captive raccoons by rehabilitators and nuisance control permittees, effective January 1, 2000. This option is straightforward, and enforcement would be clear-cut in that the possession of raccoons would be unlawful except for the purpose of euthanasia within 24 hours.

- Option 2 would require humane euthanasia of captured raccoons from any county within a raccoon rabies containment area. In other counties, captured and rehabilitated raccoons could be released and relocated anywhere within the county of capture. This second option requires distinguishing animals originating from within and outside raccoon rabies containment areas and depends upon the physical isolation of animals and accurate record keeping by nuisance animal control and rehabilitator permittees to prevent the spread of disease in Michigan.

- Option 3 is the least restrictive and is the only option that allows release regardless of the animal's origin. Option 3 would allow possession even if the animal originated from an area known by the Department to contain raccoon-strain rabies. Like Option 2, this option will require the physical isolation of animals and sound record keeping and identification of animals to prevent the spread of disease.

The proposed Options 1, 2, and 3 for restricting the holding, release, and translocation of raccoons in Michigan are designed to maintain a parallel consistency in the regulations for both nuisance animal control permittees and rehabilitation permittees. All of the options are enforceable under State law; however, the potential mechanism of disease spread and complexity of the regulations varies by option. Any mistakes or inadvertent cross-contamination of animals could facilitate the spread of disease.

Relative to current rehabilitation regulations, Option 1 is most similar to the current prohibition on the rehabilitation of skunks and bats. Option 2 is most similar to the current prohibition on the rehabilitation of white-tailed deer fawns unless they can be positively confirmed to originate from outside the bovine TB eradication area.

SUMMARY

Rabies is a viral disease that is important to the citizens of the State of Michigan because it has human, pet, livestock, and wildlife implications. It is virtually always fatal in these species. All mammals are susceptible to rabies, but wildlife species are the ones usually affected with bats and skunks being the most likely species diagnosed with the disease in Michigan. There is a future threat of raccoon rabies to our State as this is a rapidly spreading disease that may reach our border within five years. Regulation of wildlife species that will allow us to protect the human, livestock, and pet health in our State should be established. These proposed regulations would allow us to manage a disease that potentially could have a widespread impact in our State.

LITERATURE CITED

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